

LicenseeCall SignFrequencies

Ponce SMR, Inc.

WPDQ884

861.36250

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San Juan Caguas
SMR, Inc.

WPDQ883

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ENGINEERING STATEMENT
FOR
TELECELLULAR'S DIGITAL WIDE AREA SMR SYSTEM
IN
PUERTO RICO

TELECELLULAR proposes to construct a digital wide area SMR system on the island of Puerto Rico. The use of digital technology will allow TELECELLULAR to offer basic SMR services, as well as enhanced services such as interconnect transmission and messaging. Digital equipment will allow a single radio frequency to support up to six voice conversations with the same bandwidth needed for one analog voice conversation and will provide improved speech quality as well.

TELECELLULAR's proposed system will use Motorola's MIRS (Motorola Integrated Radio System) equipment. There are typically two types of subscriber equipment used for dispatch and interconnect service. Mobile subscribers will have units installed in vehicles with antennas mounted either on the roof of the vehicle or on a windshield of the vehicle. Portable units are carried on the person and can be operated on the street, within vehicles or within buildings. Listed below are the levels of service TELECELLULAR will provide according to the location and type of subscriber equipment used:

- **In-Building Portable Coverage (-70 dBm)**
The minimum signal strength that must be provided by the system so that portable transceiver operation can be achieved inside buildings.
- **In-Car Portable Coverage (-80 dBm)**
The minimum signal strength that must be provided by the system so that portable operation inside a vehicle can be achieved.
- **Outside Portable (-90 dBm)**
The minimum signal strength that must be provided by the system so that portable operation outside can be achieved.
- **Mobile Coverage (-95 dBm)**
The minimum signal strength required for satisfactory mobile and on-street coverage.

Because mobile subscribers have higher PA output, they will be able to generate higher RF power levels. Accordingly, sites associated primarily with mobile subscribers may cover large areas; therefore, fewer sites are needed in areas with predominantly mobile subscribers.

Most portable subscribers use their units in areas of high business, residential and traffic densities. Although the portable units would provide high quality reception at the same signal level as the mobile units, portable transmitter power is lower and therefore the talk-back range is less. Additionally, portable units used within vehicles and within buildings have additional propagation attenuation associated with obstructions when compared to on-street portable units and to mobile units. Therefore, the expected two-way coverage area for portable units and how they are expected to be used is less than for mobile units. More base station sites are required to provide coverage in regions with this type of usage.

Given these factors, TELECELLULAR's system will provide portable in building coverage (-70 dBm) in the core of Puerto Rico's cities and major airports. In-car and outside portable coverage (-80, -90 dBm) will be provided in the metropolitan areas of San Juan, Ponce, Mayaguez, Caguas, Arecibo, Aguadilla and Route 2 from Arecibo to San Antonio. Mobile coverage (-95 dBm) will be provided along the highways connecting the above mentioned metropolitan cities. All sites constructed for TELECELLULAR's system to meet these criterion will be engineered to meet the co-channel licensee protection requirements provided in the Commission's rules.

For ease of reference, system design will be discussed by dividing Puerto Rico into three regions: San Juan, Ponce and Mayaguez. To determine the number of sites required in each region, the following subscriber rates were projected for each region in years one through five:

Region	Year 1	Year 2	Year 3	Year 4	Year 5
San Juan	7,500	17,500	30,000	40,000	50,000
Ponce	1,600	9,625	16,500	22,000	27,500
Mayaguez	2,400	7,875	13,500	18,000	22,500
Total	11,500	35,000	60,000	80,000	100,000

To service the listed subscriber rates with the required coverage standards, TELECELLULAR will construct approximately 20 base station sites, 15 in the San Juan region, 2 in the Ponce region and 3 in the Mayaguez region in its first year of operation.

In year two, TELECELLULAR will add approximately 21 base station sites to its system for a total of approximately 41 base station sites. Ten will be built in the San Juan region, four in the Ponce region and seven in the Mayaguez region.

In year three, TELECELLULAR will add approximately four base station sites to the Ponce region. By the end of year three, it is estimated that TELECELLULAR will have built approximately 45 base stations throughout Puerto Rico.



In year four, it is anticipated that TELECELLULAR will construct one base station in the San Juan region, bringing that region's total to approximately 26. In Ponce, TELECELLULAR will add five base stations for an approximate total of 15. In Mayaguez, TELECELLULAR will construct two base stations for a total of 12.

It is anticipated that at the end of year five, TELECELLULAR will have constructed 36 sites in San Juan, 20 sites in Ponce and 17 sites in Mayaguez, a total of 73 base station sites in Puerto Rico.

Based on the current subscriber projections, it is anticipated that the 170 SMR channels licensed to TELECELLULAR's participating licensees will provide sufficient capacity for the system. However, the possibility remains that further channel capacity may be required to meet greater than expected subscriber demand.

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